CLAIMS

1. A purified functional polynucleotide comprising an actuator domain, a receptor domain, and a bridging domain, wherein interaction of the receptor domain with a signalling agent triggers a conformational change in the bridging domain which modulates the activity of the actuator domain.

SUB B2

2. A polynucleotide according to claim 1 wherein the signalling agent is a ligand that binds to the receptor domain.

3. A polynucleotide according to claim 1 wherein the activity of the actuator domain is catalytic.

4. A polynucleotide according to claim 1 wherein at least two of the domains are non-overlapping.

5. A polynucleotide according to claim 1 wherein at least two of the domains are partially or completely overlapping.

6. A polynucleotide according to claim 1 which is RNA.

7. A polynucleotide according to claim 6 which is a hammerhead ribozyme.

8. A polynucleotide according to claim 1 which is DNA.

9. A polynucleotide according to claim 1 wherein the actuator domain exhibits catalytic activity that is triggered by binding of a chemical compound to the receptor domain.

SUB A2

10. A biosensor comprising a polynucleotide according to claims 1, 2, 3, 4, 5, 6, 7, 8, or 9.

11. A biosensor according to claim 10 in which the polynucleotide is attached to a solid support.

12. A method for detecting the presence or absence of a ligand or its concentration in a sample comprising contacting the sample with a polynucleotide according to claims 1, 2, 3, 4, 5, 6, 7, 8, or 9.

13. A method according to claim 12 wherein the presence or absence of a ligand or its concentration is determined by observation of a chemical reaction.

14. A method according to claim 12 wherein the presence or absence of a ligand or its concentration is detected by observation of a change in polynucleotide configuration or function.

15. A process for preparing polynucleotides that are responsive to the presence or absence of a signalling agent, comprising linking a polynucleotide actuator domain, a receptor domain, and a bridging domain together such that interaction of the signalling agent with the receptor domain triggers a conformational change in the bridging domain which modulates the activity of the actuator domain.

16. A process according to claim 15 wherein the receptor domain has a ligand binding site and wherein ligand binding triggers a confirmational change in the bridging domain that stimulates catalytic activity of the actuator domain.

17. A process for screening polynucleotides which have an actuator domain, a receptor domain, and a bridging domain and which are responsive to a signalling agent in a sample, comprising linking a bridging domain having defined properties that modulate the activity of a corresponding actuator domain having defined properties, to a receptor domain having a random sequence, and identifying polynucleotides responsive to the signalling agent by incubation of the sample with the polynucleotide so constructed by observation of modulation of the activity of the actuator domain.

18. A process according to claim 17 wherein the receptor domain has a ligand binding site and wherein ligand binding triggers a confirmational change in the bridging domain that stimulates catalytic activity of the actuator domain.

19. A process for preparing RNA sensors according to any of claims 15, 16, 17, or 18.

20. A process for preparing DNA sensors according to any of claims 15, 16, 17, or 18.